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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,972	10/28/2003	Takahiko Kurosawa	244574US0	5776

22850 7590 12/15/2004

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

CHACKO DAVIS, DABORAH

ART UNIT PAPER NUMBER

1756

DATE MAILED: 12/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/693,972

Applicant(s)

KUROSAWA ET AL.

Examiner

Daborah Chacko-Davis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 2004/0132243 (Kurosawa et al) in view of U. S. Patent No. 6,777,159 (Itatani et al).

Kurosawa, in [006], [0014], [0223], and in figures 1A, 1B, 1C, 1D, and 1E, discloses a method of forming a cavity between multilayered wirings comprising coating a dielectric film (reference 1) on the substrate, forming a photoresist composition (reference 2) (polymeric composition including alicyclic hydrocarbons) on the dielectric layer, patterning the polymeric composition layer to form cavities (grooves), forming a metallic wiring (reference 3) in the grooves of the polymer, depositing a second dielectric film on the polymer and metallic wiring patterns (reference 4), and removing the polymer patterns between the metallic wiring to form a cavity (reference 5) between the metal wirings (claim 1). Kurosawa, in [0175], discloses that the polymer has a weight average molecular weight of about 300,000 as reduced into polystyrene (claim 2). Kurosawa, in [0248], and [0249], discloses that the cyclic polymer has a weight loss of about 5 wt % when heated to about 350°C in an inert gas atmosphere or in a vacuum atmosphere, and the cyclic polymer has a weight loss of about 80 wt % when heated to

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about 500°C in an inert or vacuum atmosphere (claim 3). Kurosawa, in [0250], discloses that the polymeric composition has a glass transition temperature of about 300°C (claim 4). Kurosawa, in [0251], discloses that the polymeric composition has an elastic modulus higher than 4.0 GPa (claim 5).

The difference between the claims and Kurosawa is that Kurosawa does not disclose the polymeric composition applied on the dielectric film for patterning is a polyamic acid or a polyimide obtained from at least one alicyclic tetracarboxylic acid dianhydride (formula 1 of claim 1), and at least one alicyclic diamine (formula 2 of claim 1).

Itatani, in col 2, lines 17-31, discloses the use of polyimide compositions for forming thin film pattern of polyimide, wherein the polyimide is obtained by the polycondensation between an alicyclic tetracarboxylic dianhydride and an alicyclic diamine.

Therefore, it would be obvious to a skilled artisan to modify Kurosawa by replacing the polymeric composition with the polyimide composition suggested by Itatani because Itatani, in col 2, lines 29-31, and in col 11, lines 25-44, discloses that using the polyimide composition for patterning enables the formation of resist patterns with good pattern profile, and using the patterned polyimide for etching enables the accurate transcribing of the pattern to the substrate without sagging.

Conclusion

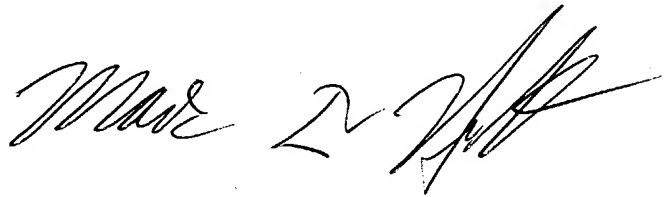
3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is

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(571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd

pd
December 11, 2004.



MARK F. HUFF
SUPERVISOR, PATENT EXAMINER
TECHNOLOGY CENTER 1700